

NOAA Restoration Day - 2004

Setup Instructions For Growing Redhead Grass and Sago Pondweed

PREPARATION AND SETUP:

1. Prepare the growth chamber:

This project is fairly easy to set up and maintain, but it will require some planning on your part. Please take a look at the time requirements in the box below. Then read through the detailed description of the steps that follows.

TIME TO ALLOW FOR SYSTEM SETUP AND MAINTENANCE:

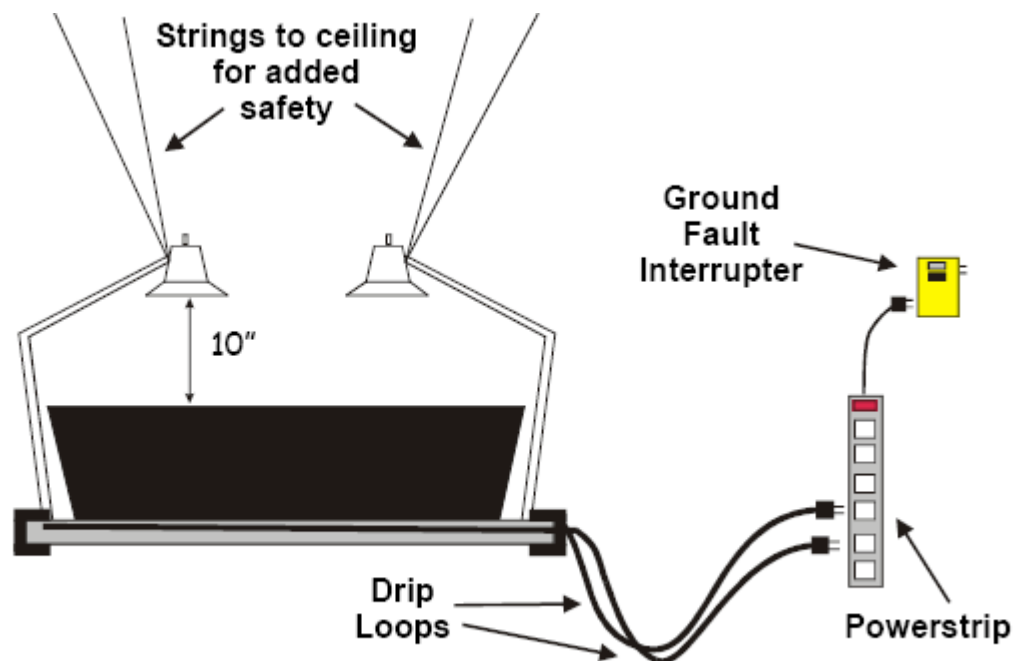
30 minutes: assemble Bay grass growth chamber (attach and assemble lights, assemble filter, fill black tub with water, add heater, and plug in heater and filter).

30 minutes: mix topsoil and sand, fill trays, cover with sand, lower into water in tub, and plant turions or winter buds.

Daily: check water, temperature, sponge, and algae level of growth chamber

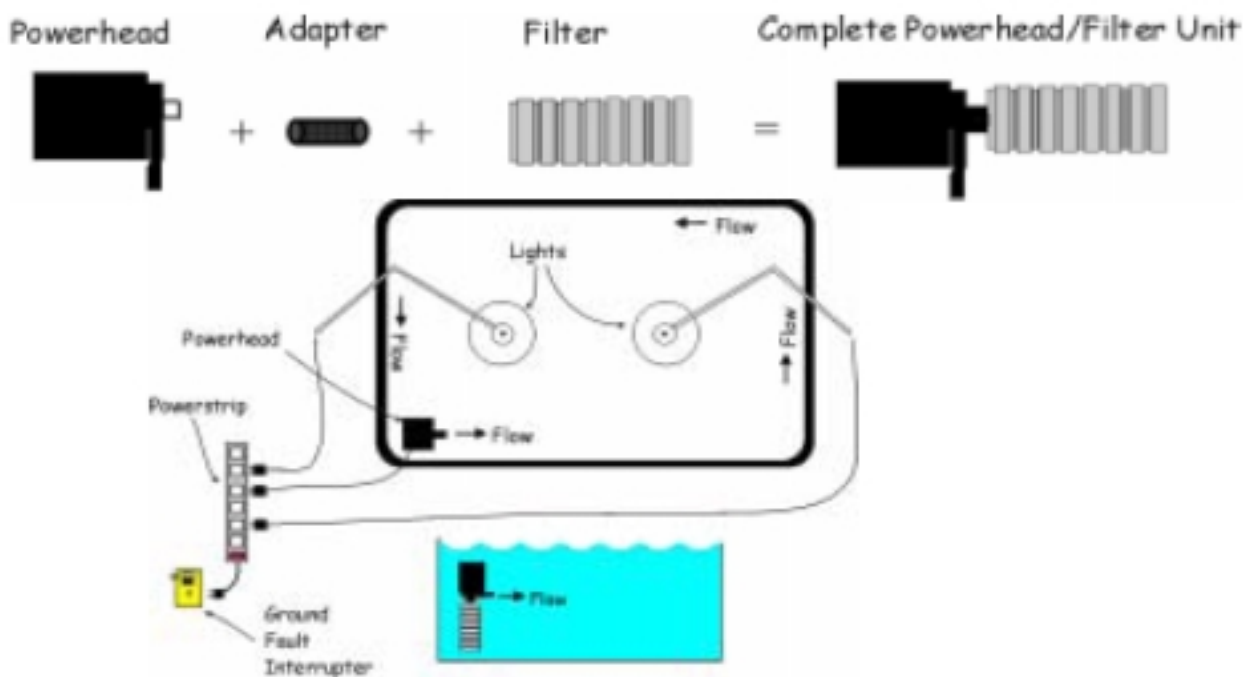
½ day: attend June 15 planting event in Grasonville --"NOAA Restoration Day."

Once you have all the components for your Bay grass growth chamber (see checklist of materials needed), you will need to assemble them in your office. You will not be able to move this tank when it has water in it, so choose your location carefully. A good location would be on a sturdy table near an electrical outlet. The system does not need to be located near a window, but it does need to be in a room with a stable temperature. Assemble the growth chamber, add water, and stabilize water temperature before adding the plants. The workshop will demonstrate what the system should look like once it's fully assembled. The illustration below will also give you some guidelines:



Growth chamber preparation procedure:

- A. Place tub on a sturdy table or file cabinet. A table with edges to which you can clamp the lights works best. If you need to buy a table, Office Depot sells one with folding legs, 2'x4' for \$30 that makes a great printer or work table after the project.
- B. Assemble the lights and attach to the table so they can sit about 10" above the water surface, equidistant from each other, the tank edges, and the middle of the tank. An optional wood block may be used for extra stability attaching the lights to the side of the tub. **Note: safety precautions should be taken when dealing with the lights.** The lights should be plugged in to the power strip, which includes a Ground Fault Interrupter (GFCI) in its plug. *Do NOT use a different power strip since it will not include the GFCI.* You may also attach string from the lights to the ceiling for added safety. The lights (as well as the pump and the heater) should be kept on 24 hours a day.
- C. Prepare the powerhead pump (filter) by attaching the conical plug of the powerhead to the water intake of the powerhead. Keep in mind that the powerhead has a number of additional attachments that are not necessary for our purposes. All you will need is the cone shaped attachment on the intake and the suction cup bracket to attach the powerhead to the side of the tub. Then attach the sponge filter over the intake, either slipping it over the cone shaped attachment, or fitting it into the hole, depending on which kind you have. It's a snug fit. The sponge filter will prevent debris particles from clogging up the powerhead. It will also provide a place for helpful bacteria cultures to grow. Attach the powerhead with filter to the side of the tub using the suction cup bracket. Make sure that the water flow isn't disturbing the sediment, but it should circulate water through the whole tank. You may have to experiment with the placement of the powerhead. See the illustration below for guidance:



- D. Fill the tank with water. Regular tap water is fine. The water level needs to be somewhere between the top of the leaves and the top of the tub at all times. If the faucet in your sink is too low to get a bucket under it, a 2.5 gallon collapsible water jug sold in camping stores works very well.
- E. Test the lights. **Please note: anything plugged into the power strip should have a “drip loop” to prevent water from accidentally dripping into the power strip.**
- F. Plug in the powerhead to the power strip (leave it on). It should immediately begin circulating water in your tank. Make sure water is circulating well but not splashing out of the tank, and that the suction cups are firmly attached to the side of the tub.
- G. Set the *unplugged* heater thermometer to 72 degrees and attach it to the inside of the tank close to the bottom, **then** plug it in to the power strip and leave it on. If it is plugged in when not in water it rapidly overheats.

2. Add the Bay grass: Basically, you will be filling the pans with a sand/soil mixture, covering the mixture with white play sand to keep the water cleaner, lowering covered pans into the black tub, and planting the turions or winter buds in the pans. Turions and winter buds are like the bulbs you plant to get spring flowers. Please read the detailed procedure below:

Planting procedure:

NOTE: planting can be done before or after you lower the pans into the water in the tub. These directions are for planting after the pans are underwater, which is the usual procedure. If you prefer to plant before the pans are in the water, make sure the soil is completely saturated before you plant, and be sure to cover the pan very well as you lower it.

- A. Thoroughly mix equal amounts of **top soil** and **all purpose sand (reddish)** in a container and add a small amount of **crushed oyster shell**. Fill the pans with this mix to within 1/2 inch of the top. Pack the mixture in firmly with your fingertips. *Cover the sand/soil mixture with about 1/2 inch of white play sand so that no soil is showing.* Pack this down again.
- B. Once you have your tank set up and filled with water, use a fine mist sprayer to **thoroughly water the pans**. Take care not to disturb the layer of sand on top.
- C. Cover with a sheet of rigid foam (puncture it several times to add small air holes) and lower each pan gently into the water. (Take off your watch first unless it is waterproof.) Remove the cover once air bubbles stop coming out, being careful not to disturb the soil.
- D. Once all three pans are in the water and the cover is removed, you will be **ready to plant** the turions or winter buds. You should have about 25-30 turions (sago) or winter buds (red-head) for **each** of the 3 pans. Some of the winter buds may need to be divided first. Plant them in rows, so that you get an even distribution in each pan. Gently push the turion or winter bud into the soil, 1/2” to 1” deep depending on their size, using tweezers. Grasp both with the growing tip pointing up. The turion or winter bud needs to be in the soil beneath the sand layer, and should not stick above the sand. Use your fingers to close the holes.
- E. After 5 weeks of growth, **salt needs to be added** to the water in the black tub. Dissolve **the contents of the salt package** in 1-2 gallons of water (a bucket works well). Let dissolved solution stand for at least an hour. Pour entire contents of bucket into red-head system. After the salt has been added, you should not change the water in the tub, just add more water as it evaporates. Salinity should now be about 5 parts per thousand.

You should see some growth within 2 weeks; if you do not, contact Alison Hammer and she may have some extra turions or winter buds.

Maintenance: A few minutes each day is all you need to keep your grasses growing and healthy!

A. Check water level - it is OK to ignore the plants for a few days at a time without worries PROVIDED THE WATER LEVEL IS ADEQUATE. If the water level drops below the powerhead intake or the heater, they will break and an electrical shock could result. Water level will drop about 1-2 inches per week, or about a gallon a day, but this could vary significantly by location. Be sure that tanks are well filled before leaving for long weekends. You may want to mark the side of the tub for the ideal water level so that you know when to refill.

B. Clean filter and algae – the sponge filter attached to the powerhead will need to be rinsed in tap water as it accumulates debris, or it will clog. Check it periodically but remember that it also houses beneficial bacteria, so don't use any cleaners or rinse it too often. As algal growth builds, you may see a green sheen on the plants, sand, water surface, or tub. You can use your fingers to gently wipe off algae from plant stems. A fine mesh fish net works well for skimming the water surface and the tub can be wiped with a cloth. Do this as often as needed. Make sure the power head is firmly attached when you replace the sponge filter; **if it comes loose it may spray water out of the tank.**

C. Monitor temperature – The water temperature should stay near 72 degrees F. Check the floating thermometer regularly to make sure you have the optimal conditions for germination and growth. You may need to periodically adjust the heater to above or below 72, depending on the thermometer reading.

Preparing the grasses for planting:

You will need about an hour on the morning of the planting day to prepare your plants for transport. Disassemble the lights, powerhead, and heater. Keep the thermometer in the tub to monitor temperature throughout the day. Lower the water level so that there is just enough water to keep the plant parts submerged. Wet newspapers should be used on top of the grasses to keep from splashing and drying out during transport. If the plants are well covered with several layers of wet newspaper you may not need to keep any water in the black tub, which makes it much easier to transport. Ice may need to be added to the tub on top of the newspapers if it is a hot day or very sunny.

We will want to know the date that you planted the turions or winter buds and approximately how many plants you have at planting time, and average and longest stem lengths. Bring this information with you to the planting or e-mail it to us just before.

QUESTIONS? If you have **any problems or questions** about the system, please contact Alison Hammer (301-713-3000 x110, alison.hammer@noaa.gov) or Peter Bergstrom (410-267-5665, peter.bergstrom@noaa.gov).

(These directions were adapted from ones prepared by Jill Bieri, Chesapeake Bay Foundation, for their "Grasses for the Masses" program.)